

## WHAT IS CLAIMED IS:

1. An apparatus for performing biological reactions on a substrate surface, the apparatus comprising:
  - a biochip comprising:
    - a substrate; and
    - a plurality of arrays of biologically reactive sites on said substrate;
  - a base plate; and
  - a gasket affixed between the biochip and the base plate, the gasket defining a plurality of reaction chambers, each reaction chamber corresponding to one of the arrays.
2. An apparatus according to claim 1, wherein the base plate defines at least one well structure, at least one reaction chamber being positioned to include the well structure.
3. An apparatus according to claim 1, further comprising:
  - a first port extending from at least one of said reaction chambers through the base plate.
4. An apparatus according to claim 3, further comprising a second port extending from at least one said reaction chambers through the base plate.
5. An apparatus according to claim 1, wherein at least one of the plurality of arrays of biologically reactive sites comprises oligonucleotide probes.
6. An apparatus according to claim 1, further comprising a heating element positioned to heat at least one reaction chamber.
7. An apparatus for performing biological reactions on a substrate layer comprising:
  - a substrate having a first surface containing a plurality of biologically reactive sites disposed thereon;
  - a base plate having a first surface and a second surface, wherein the first surface further comprises a cavity comprising one or a plurality of well structures;
  - a sealing member disposed in each well structure, wherein each sealing member defines a reaction chamber between the surface of the substrate layer containing the biologically reactive sites and the first surface of the base plate; and
  - a fluid port connected to at least one reaction chamber.
8. An apparatus according to claim 7, further comprising a second port extending from at least one said reaction chambers through the base plate.
9. An apparatus according to claim 7, wherein at least one of the biologically reactive sites comprise oligonucleotide probes.

10. An apparatus according to claim 7, further comprising a heating element positioned to heat at least one reaction chamber.